

Cultivation Technical Assistance

Protecting Your Crop from Pests and Disease



March 16, 2023
Peer Networking Event

Why?

Responsible Pest and Disease Management

- Protects the Consumer
- Protects the Integrity of the Industry
- Protects your Brand
- Protects your Bottom Line

Some Guiding Principles:

- No amount of pest or disease pressure is worth using residual pesticides
- Every environment is different and there is no single solution
- The pest and disease battle requires constant vigilance
- PREVENTION IS THE BEST MEDICINE

Prevention Best Practices

- Good Sanitation procedures are the cheapest and most effective pest management method
- Seeds are cleaner than Leaves
- Assume live plants/clones will have issues
 - Quarantine on arrival
 - Treat and scout before introduction to grow space
- Keep Records (required for compliance)
 - Application log
 - Weekly scouting

Get to Know IPM

Integrated Pest Management

- Uses many strategies to control pests and disease
- Balances the cost of the application vs. the economic cost of the damage
- Considers the impact on the environment

Control Strategies

- Sanitation
- Environmental and Cultural best practices
- Scouting and Record keeping
- Use of BCA's: Biological Control Agents
- Chemical control ONLY AS LAST RESORT

Pesticides: The Problem and The Solution

The Bad List

- Your Pesticide Test is a good resource for what not to use!
- Ingredients listed are residual/systemic
- Compare product active ingredients with those listed on the pesticide COA
- **DO NOT USE THESE INGREDIENTS!!**

The Good List

- The allowed list is found with our pesticide guidance on the CCB website
- Provide a range of safe options
- Check product active ingredients to make sure they are allowed
- Be cautious about applying anything in late flower stages

| Category II Residual Pesticide |
|-----------------------------------|
| Abamectin |
| Acephate |
| Acequinocyl |
| Azoxystrobin |
| Bifenazate |
| Bifenthrin |
| Carbaryl |
| Cypermethrin |
| Etoxazole |
| Imidacloprid |
| Myclobutanil |
| Pyrethrin I |
| Pyrethrin II |
| Spinosyn A |
| Spinosyn D |

The BAD LIST

There are organic/ OMRI certified pesticides using the active ingredients on this list!

OMRI products are NOT automatically appropriate for use on Cannabis

These materials were not designed for the many ways Cannabis is processed and consumed

The GOOD LIST

| Active Ingredient | Product Example (s) | Pesticide Type |
|---------------------------------------|------------------------------------|-----------------------------------|
| Acetic acid | Vinagreen | Herbicide |
| Azadirachtin / Neem | Azamax, Azasol, Molt-X | Insecticide, Miticide, Nematicide |
| Ammonium soaps for higher fatty acids | Finalsan Herbicidal Soap | Herbicide |
| Bacillus spp. | Double Nickel, Serenade, Agree WG | Fungicide, Insecticide |
| Beauveria bassiana spp. | Botanigard ES | Insecticide |
| Isaria spp. | PFR-97 20% WDG, Preferal Microbial | Insecticide |
| Streptomyces spp | Mycostop, Actinovate | Fungicide |
| Trichoderma | Rootshield, Incept | Fungicide |
| Citric acid | Eliminator | Miticide, Insecticide, |
| Cytokinins | Agra-Rouse | PGR-General |
| Diatomaceous Earth | Celite 610, Diafil 610 | Insecticide |
| Geraniol | Banish | Fungicide |
| Gibberellic acids | HM-1354-A | PGR-General |
| Hydrogen dioxide | Terraclean 5.0 | Fungicide, Bactericide |
| Hydrogen peroxide | Jet AG | Fungicide, Algaecide |

| Active Ingredient | Product Example (s) | Pesticide Type |
|--|--|---|
| Indole-3-butyric-acid | Clonex Rooting Gel | PGR- Growth Stimulator |
| Canola oil | Natural Guard Brand Horticultural Oil | Insecticide, Fungicide, Miticide |
| Mineral oil | All Season Horticultural & Dormant Spray Oil Concentrate | Insecticide, Fungicide |
| Soybean Oil | Golden Pest Spray | Insecticide |
| Castor oil | Mole & Vole Stopper | Rodent repellent |
| Cinnamon oil | Safer Gro | Herbicide |
| Clove oil | Nature-Cide All Purpose | Insecticide |
| Cottonseed oil | Spider Mite Control | Miticide |
| Garlic oil | Captiva | Insecticide |
| Mint oils | Trifecta Crop Control | Fungicide, insecticide |
| Rosemary oil | Trifecta Crop Control | Fungicide, insecticide |
| Sesame oil | Organocide 3-in-1 Garden Spray | Miticide, Insecticide, Fungicide |
| Thyme oil | Thyme Guard | Fungicide, Insecticide, Bactericide, Virucide |
| Peroxyacetic acid | Bioside HS 15% | Fungicide |
| Potassium bicarbonate | Kaligreen | Fungicide |
| Potassium salts of fatty acids | Exile, KOPA Insecticidal Soap, Safer Soap | Insecticide, Fungicide, Miticide |
| Mono and Di-Potassium salts of phosphorus acid | Fosphite | Fungicide |
| Reynoutria sachalinensis | Regalia | Fungicide, PGR-General |

The GOOD LIST

What's On It?

- Ingredients are considered safe for consumers
- Includes Biological pesticides
 - Bacteria
 - Mycorrhizae and similar organisms
 - Insecticidal Fungus
- Ingredients on the list could be found in EPA registered or 25B category pesticides
 - EPA registered products are better researched and regulated
 - 25B products may have mislabeled active ingredients
- Manufacturers can be good sources of information and support
 - Many have cannabis specific supports and application schedules

The GOOD LIST: How To Use It

Diseases

COMMON DISEASES

- Powdery Mildew
- Botrytis (Grey mold, Bud rot)

POSSIBLE SOLUTIONS

- Bacillus spp.
 - Double nickel, Cease
- Oils (mineral and botanical)
 - Suffoil-X
 - Banish (Geraniol)
- Peroxides
 - Zero-tol
- Potassium Bicarbonate
 - Milstop

The GOOD LIST: How To Use It

Insects

INSECT PESTS

- Spider mites
- Aphids
- Thrips

POSSIBLE SOLUTIONS

- Potassium salts of fatty acids (insecticidal soaps)
- Azadirachtin (Neem derived)
 - Azamax
- Beauveria bassiana
 - Botanigaurd
- Oils (Mineral and Botanical)
 - Soybean, mint, garlic oils
- Citric Acid
 - Dr Zymes

The GOOD LIST

Products of Note

REGALIA

- Contains the active ingredient *Reyoutria sachalinensis* (a type of knot weed)
- Stimulates the plants immune system
- Is listed as a fungicide
- Works best if applied regularly in vegetative stages

BOTANIGARD

- *Beauveria bassiana* is an insecticidal fungus
- Will infect many different types of insects – a generalist
- Boosts the effectiveness of materials like azadirachtin when used in a tank mix
- Is a good addition to clone dips

Beyond the GOOD LIST

Biological Control Agents

- The Standing Army
- Requires good scouting and ID to use effectively
- Can be cost effective or costly depending on management
- Totally safe for late flower insect issues!!
- Takes research and practice to use effectively
- Perishable life forms that need TLC when shipping and handling
- Much easier and faster to apply than pesticides (and more FUN!)

Using BCA's to fight FUNGUS GNATS

FUNGUS GNATS

- Annoying flying mosquito like insects that are common to any kind of indoor or greenhouse plant production
- Reproduce in soil or media
- Larvae may feed on roots
- Adults don't feed but can stick on flower if high in numbers

STEINERNEMA FELTIAE

- Beneficial Nematodes
 - Nemesys, NemAttack
- Effective solution used in large commercial greenhouses
- Can be applied through irrigation
- Best if applied weekly or bi-weekly
- Must be stored under refrigeration

QUESTIONS?

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[CCB.Vermont.gov/guidance](https://www.vermont.gov/ccb/guidance)

